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## **Profiling the Occupational Tasks and Physical Conditioning of Specialist Police**

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### **ABSTRACT**

*International Journal of Exercise Science 12(3): 173-186, 2019.* Specialist police are required to perform high risk and dangerous tasks that are physically demanding. The aims of this study were to establish the natures and contexts of tasks performed by specialist police officers and to explore the physical fitness regimes they undertake to maintain their operational fitness for these tasks. A survey approach was employed and members of operational units of the Australian and New Zealand Police Tactical Groups (PTG) participated in the survey. A total of nine (100%) PTG units cooperated, with 132 respondents (31% of the PTG operational members) from these units completing the online survey. The occupational task most commonly recently undertaken by PTG was a high-risk warrant execution (62% of respondents) followed by rural operations (11% of respondents). The nature and environment of operations varied, and external load was carried in all operational circumstances, with loads typically 21-25 kg. All officers undertook regular physical training, with 73% focusing the physical training on occupation-specific training. Whether the training was actually occupation-specific was difficult to determine, given the current lack of research identifying the physical fitness requirements of key occupational tasks undertaken by specialist police.

**KEY WORDS:** Law enforcement, tactical load carriage, physical performance, SWAT, performance

### **INTRODUCTION**

Personnel who serve in law enforcement are deemed to be part of a group termed 'tactical personnel' (10, 18). These personnel have a sworn duty to protect life and property and, as part of their occupation, are required to perform physical tasks in the execution of their high-risk duties (5). Tactical personnel include, but are not limited to, law enforcement officers and the specialist police tactical groups (PTG) within law enforcement organizations.

The law enforcement officer's daily job requirements can vary immensely in nature and description and often include dynamic and intense physical activity performed whilst under physical stress (7). These physical activities combine to impact on the metabolic and musculoskeletal systems as well as the general physical capabilities of the officer. For example, an anaerobic sprint or sustained run may be required when chasing a suspect and may involve

concurrently negotiating obstacles (like steps and fences) and then wrestling with a non-compliant suspect (7). Further, the evolving role of the law enforcement officer has led to this population being required to wear and carry more equipment (20). This equipment can include, but is not limited to, personal protective equipment (PPE; such as a ballistic vest) and an array of other equipment, like handcuffs, batons, side arm, Tasers, capsicum spray, and more. Having to carry and wear these additional loads on a daily basis may negatively impact the ability of tactical personnel to perform their tasks effectively and safely (5, 20).

In Australia, specialist law enforcement personnel are members of the police tactical group (PTG; often, in law enforcement organizations, referred to as special weapons and tactics (SWAT) teams). These specialist occupations and the tasks they involve (like hostage rescue) are high risk in nature (29). Often the tasks these specialist personnel are required to undertake require repeated or sustained, high-intensity bouts of physical activity, which can negatively affect their ability to maintain power, speed and agility (7). In addition, when undertaking these high intensity tasks, these specialists are required to carry heavier external loads (e.g. from 22 kg (4) up to 40 kg (11)) than general police officers (e.g. around 10 kg (1, 3)) to assist in achieving task outcomes and to reduce occupational risks (5). This additional load can arise from their requirement to carry additional weaponry and other specialized equipment (e.g. ballistic riot shield or breaching equipment). The occupational load carriage requirements of these specialists, whilst important for operational outcomes, can have a negative impact on their operational mobility (5) and are associated with a high metabolic cost (28). In combination, the requirement to perform repeated or sustained high intensity bouts of physical activity and the large physiological burden of carrying heavy loads can reduce physical performance and may impair overall unit capability and achievement of mission outcomes (8).

To meet these unique demands and to successfully complete basic selection and training and undertake their missions and tasks, specialist PTG personnel require a high level of physical fitness (11). While the need for high levels of physical fitness to optimize mission success is intuitive, the actual missions and tasks completed by these specialists are not well understood, and neither is the physical training they undertake to maintain their operational fitness. On this basis, the extent to which the levels of fitness of these specialist personnel and the fitness training they undertake align with the physical demands of the occupation cannot be accurately ascertained. For these reasons, the aims of this study were to establish the natures and contexts of occupational tasks performed by specialist police officers and to explore the physical fitness regimes they undertake to maintain their operational fitness for these tasks.

## **METHODS**

### *Participants*

The Australian-New Zealand Counter-Terrorism Committee (ANZCTC) is overseen by the National Security Capability Development Division of the Australian Attorney-General's Department. All of the state and federal policing jurisdictions of Australia and New Zealand are part of this response framework and each policing agency has a specialist Police Tactical Group (PTG), which is represented on the ANZCTC. Each PTG represented on the ANZCTC - nine in

total - was invited to be involved in this study. Participants in the study were recruited from the officers serving in these PTGs, who were invited to participate because they experience greater occupational exposure to the specialist police environment than any other Australian or New Zealand law enforcement personnel. All personnel of the PTG units at the time of the study were invited to participate provided they met each of three inclusion criteria and did not meet either of two exclusion criteria. The three inclusion criteria were: a) the officer was a fully qualified and operational member of a PTG unit; b) the officer was currently attached to the operational teams of the unit; and c) the officer was serving in a full-time capacity. The two exclusion criteria were that: a) the officer was on a return-to-work plan following injury, or b) the officer was currently working the ANZCTC but was from a service outside of the ANZCTC.

### *Protocol*

A survey design was utilized for this study. The major benefit of employing a survey approach is that it can capture information directly from a sample of participants recruited from the population of interest, in this instance the operational members of the Australia and New Zealand PTGs, who are stationed across multiple geographic locations around Australia and New Zealand, and internationally when on an international deployment. An online survey questionnaire was designed for the study, in accordance with the evidence-based recommendations of Parsons (21).

The survey questions were designed by the researchers, specifically catering for the specialist police tactical officers in terms of environment, terminology, context, and acronyms. For example, the acronym MOUT (Movement over urban terrain), a known term used by specialist police related to the context of a key task undertaken in their operational environment. Questions were designed to elicit responses that would elucidate key aspects of the daily occupational tasks and training regimes undertaken by officers. Prior to administering the survey, a pilot survey was conducted to identify ways to increase the reliability of the survey tool and to ensure the survey would reach the intended participants and retain functionality, across the nine different police information technology (IT) security systems of the nine PTGs. The final online survey questionnaire administered to the survey participants from the nine PTG consisted of 78 questions, grouped into five sections, A through E (A: Demographics; B: Occupational tasks/demands, C: Occupational skills, D: Physical conditioning and E: Injury history). This paper reports the findings from questions relating to the respondent's demographics, occupational tasks and physical conditioning (Sections A, Questions 1-7; Section B, Questions 6-16; Section C, Questions 21-28; and Section D, Questions 32-37).

Data were collected via the survey questionnaire, administered online and hosted by SurveyMonkey, an independent online survey provider. This survey method and format, utilizing Survey Monkey, allowed respondents to remain anonymous and had been used previously in the cooperating PTG organizations, and so those officers invited to participate in the survey were already familiar with this survey platform. Respondents were allowed to interrupt and then return and continue the survey but were, however, only able to complete and submit their online questionnaire once (24, 25). Concerns that results of the online questionnaire might be impacted by people external to the PTGs accessing and completing it were mitigated

by a requirement for each respondent to log into their respective Police Mainframe Restricted Network in order to access the link to the online questionnaire. The online survey was administered over a six week period, with the exact timing of access for personnel from particular PTGs dependent on unit availability, amidst operational activities (24, 25). The research received in-principle support from the senior executive command of every police jurisdiction and overarching support for the research was provided by the ANZCTC. Ethics approval for the research was provided by the Bond University Human Research Ethics Committee (BUHREC No: 15455).

### *Statistical Analysis*

PTG Unit cooperation and survey response rates were calculated using methods recommended by the Institute for Social and Economic Research and the American Association for Public Opinion Research (AAPOR) (27). Unit cooperation rates were defined as the percentage of units, from those identified and approached, that were willing to participate. Survey response rates were defined as the percentage of officers invited to participate in the survey who met the criteria for having completed the survey (i.e. completed over 80% of questions from each section). Survey response rates were adjusted for anticipated errors via the formula recommended by AAPOR (27). Anticipated errors included disruption to internet services and invitation emails being captured in spam filters or IT security system firewalls.

Data from the survey were first cleaned, with missing data simply recorded as missing and not replaced by interpolation or any other method. Data analysis was performed using SPSS statistics for Windows, version 23.0 (26). The data analysis was primarily descriptive in nature, and involved deriving and in some cases graphing frequencies of particular response categories, and means and standard deviations for some questions (for example, demographic questions), as appropriate. All complete responses were utilized in the analysis, with partial responses also included where possible (i.e. when responses to a question being analyzed contained the required data). For this reason, N values varied in the results derived from responses to the survey questions, depending on the numbers of respondents who provided valid responses to the respective questions.

## **RESULTS**

**Response Rates:** Of the nine units approached under the ANZCTC, all nine units agreed to participate in the study. On this basis, the unit cooperation rate was calculated as 100% (n=9) and unit refusal rate as 0% (n=0). With all PTG units willing to engage in the research, an invitation to participate in the survey was sent, by email, to approximately 430 police email addresses for operational personnel serving in these PTG units. Discussions with staff of the PTG units who distributed the invitations to complete the anonymous online survey by email confirmed that the email invitations were sent out to group lists which did not exclude personnel who might have been on leave, detached to other units, on training courses, or on deployment, and hence would not have received the emailed invitation during the survey period. On this basis, the response rate now discussed is likely to be quite conservative.



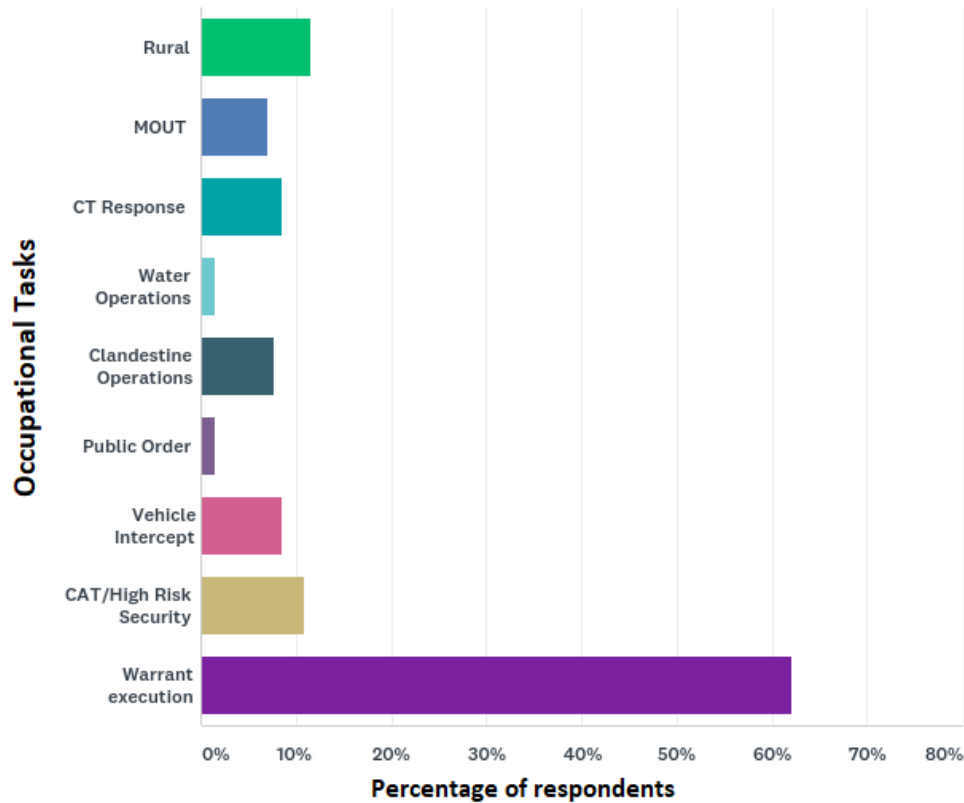
A total of 136 personnel commenced the online survey, completing initial demographic data (Questions 1-4). Among these personnel who initiated participation, survey completion rates were 97%, with only four (n=4) failing to complete the survey. This provided a total of 132 complete respondent data sets for analysis. On this basis, the survey response rate was 31%, though as noted above, it is highly likely this calculated response rate is quite conservative. Further contextualization of this response rate in relation to the PTG population was not possible given that no similar survey involving the nine PTGs has been reported in the literature.

**Demographics:** All 132 respondents were male. In many other contexts, this all-male sample would be of concern, however in this context, it was to be expected, as nearly all personnel in the PTGs were male (4, 7). The male respondents ranged in age categories from 20-25 yrs (<1%; n=1) up to 56-60 yrs (<1%; n=1), with the largest age group being the 36-40 yrs age group (37%; n=49). The range in heights of the respondents was from 161 to 210 cm and the range in body weights was from 61 to 120 kg, with the most common height category in the group being 181-190 cm (50%; n=66) and the most common body weight category being 91-100 kg (37%; n=49).

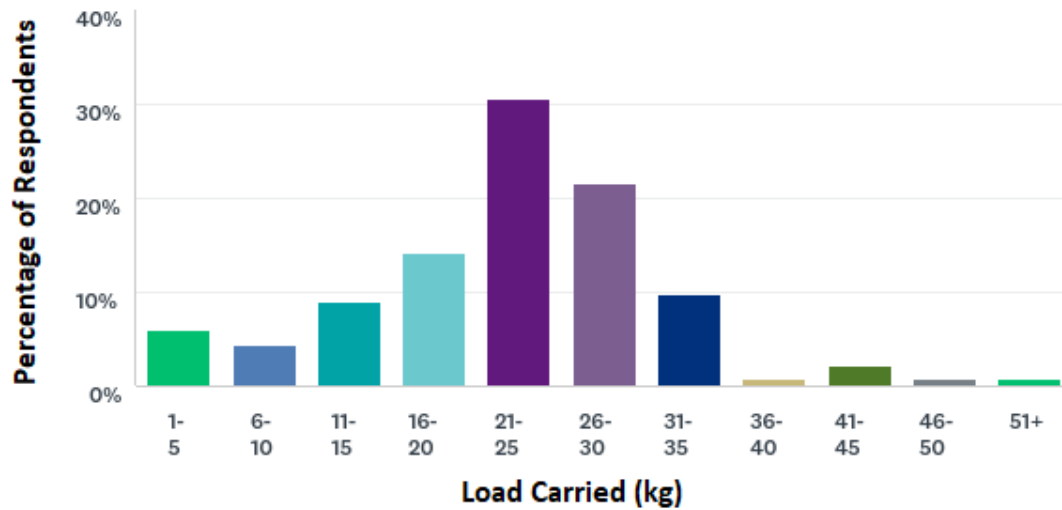
**Occupational Tasks:** Overall, 61% (n=81) of the officers reported that their most recent operational occupational task (Figure 1) was the execution of a high-risk warrant. Of note, the next most common task was rural operations (i.e. outside of an urban environment, often featuring long duration load carriage), reported by 11% (n=15) of respondents to be their most recent operational occupational task. The least frequently reported operational task was water operations (2%; n=2). When asked if the most recent task reported was a common task, 81% (n=107) responded 'yes' with the remaining 19% (n=25) reporting 'no'.

**Load Carriage in the most recent operation:** An important subset of questions in the survey was designed to contextualize the most recent operational tasks reported by respondents, focusing on load carriage requirements of those tasks. Overall, 84% (n=111) of the respondents reported they carried 'full operational equipment' (i.e. Personal Protective Equipment, ballistic helmet, ballistic vest, night vision goggles, gas mask, magazines, munitions, two or more weapons, and other task supporting equipment), while the remaining 16% (n=21) reported not wearing 'full operational equipment loads'. It must be noted that all officers carried some load when undertaking the task, however whether full operational load was carried was the specific question in the research. The respondents were also asked whether, during their most recent occupational task, they carried additional and essential operational equipment, specific to the task (e.g. method-of-entry equipment, additional communication equipment, medical kit, etc.). Reportedly, 76% (n=100) of respondents did carry additional equipment essential for the execution of the operational task. Of note, this load was additional to their full operational load, already worn. Further, each respondent was asked to provide the estimated weight of the total operational equipment they carried on their most recent operational task. This weight was to include water, munitions, personal protective equipment (PPE), overalls, boots and weapons. Overall, the most commonly reported weight category for weight carried was 21-25 kg (31%; n=41) and the lightest load category reported was 1-5 kg, reported by 6% (n=8) of load carriers. Only 1% (n=1) of respondents reported that the total loads they carried during their most recent operational task were over 51 kg (Figure 2). Further, when questioned if they carried additional

external load on the task in addition to PPE (i.e. specific equipment required for the task), responses suggested additional loads of between 10.1-15kg (32%: n=42) with 16% (n=21) reporting they carried additional external loads of 20+kg for extended distances.



**Figure 1.** Frequencies of reported specific types of occupational tasks performed most recently. Rural: Operations in an environment outside of urban built up areas. MOUT: Movement over urban terrain. CT response: Counter Terrorism response task. Water Operations: Water borne operations, often utilizing rigid-hull inflatable boats and involving swimming and climbing. Clandestine Operations: Covert in nature. Public Order: Responding to a riot or public unrest situation. Vehicle Intercept: Team tactics used to intercept vehicles posing high risk. CAT /High-Risk Security: Counter Assault Team Security Detail, commonly involving high risk personal protection, vehicle borne.



**Figure 2.** Reported total external loads carried during most recent operational tasks.

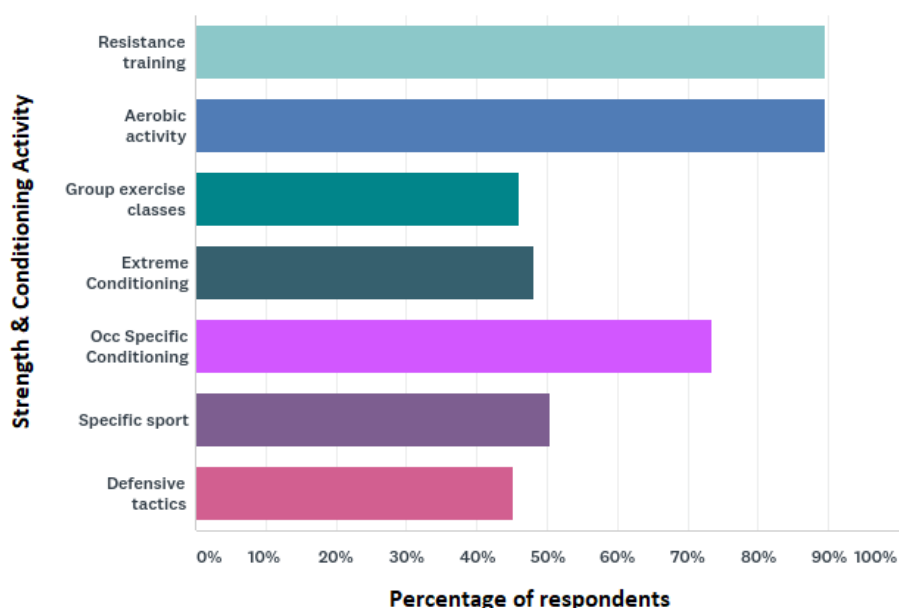
The distributions of the loads carried on the body varied only slightly across the respondents - 89% (n=117) of respondents reported their loads were carried on the upper body, and 11% (n=15) reported a split distribution of load between lower and upper body. When queried regarding whether an extended distance was covered on foot while they carried a full operational load during the most recent tactical operation, 25% (n=33) of participants responded 'yes', and 75% (n=99) responded 'no'. The most common distance covered while carrying these reported loads was between 501m and 2km (26%: n=34), but 17% of reported distances were in excess of 8.1 km (n=22).

Nature and circumstances of the most recent operation: Respondents were asked whether their most recent operational tasking was a 'call-out' response or a pre-planned operation. Of the respondents, 32% (n=42) stated that the operation was of a call-out nature, and 68% (n=93) reported that the operation was pre-planned. With regard to the forewarning given prior to the task, 37% (n=49) of the respondents reported being given less than one hour of notice, which reflects operational tasks that were emergent in nature (i.e., requiring a rapid deployment). While 46% (n=61) stated that they had been notified of the task they were to undertake 5.1 hrs or more in advance of task with the remaining 17% (n=22) being spread between 1hr and <5.1hrs.

Physical Training Profile: Of the 132 respondents, 100% (n=132) undertook physical training as part of their occupational role and all had a physical training history. The officers were asked to record which forms of physical activity they undertook, with seven response options offered (resistance training, aerobic activity, group exercise, extreme conditioning, occupation specific training, sport specific training, and defensive tactics training; Figure 3). The highest rates of participation were in 'Resistance training' and 'Aerobic activity', with 90% (n=119) of respondents reportedly engaging in each (Figure 3). In addition, 73% (n=96) of the officers recorded their physical training as being occupation specific (i.e., activity that replicates the



physical demands they may experience during operations). From the seven types of physical conditioning activities the survey listed, 84% (n=111) of the officers reported that they undertook a variety of conditioning types, indicating the officers recognized the requirement to undertake different types of training to maintain their 'fitness'. The highest frequency of this training being undertaken over a two-week period was reported as being 4 – 8 times in a two-week period (83%; n=74) with 27% (n=35) of respondents undertaking training less than 4 times in a two-week period and 17% (n=22) conducting training more than 8 times in a two-week period. The most frequently reported duration of these physical training sessions was 31-60 mins (53%; n=70), with 16% (n=21) of respondents reporting a session duration of 0-30 mins, 20% (n=26) reporting 61-90 mins and 11% (n=15) reporting 90 mins or more.



**Figure 3.** Frequencies of responses regarding the types of strength and conditioning activities undertaken.

Respondents were also asked to provide a Rating of Perceived Exertion (RPE) for the physical training they typically undertook, and this was based on a 10-point scale, where a score of '1' was considered easy and a score of '10' was considered extremely hard or a maximal effort. The most frequent response regarding the intensity of physical training typically undertaken was Level 8 (32%; n=42), indicating the individual officers undertook some form of intense activity during the two-week period. The responses ranged from the lowest rating of 1 (1%; n=1) to a rating of 10 (4%; n=5). Of note, all of the respondents who reported an RPE of 10 selected "extreme conditioning, Crossfit, Sealfit, etc" as their training type. When comparing the amount of training undertaken over the last two-week period with the amount of training undertaken over the last three months, 2% (n=3) of respondents reported that the amount in the last two weeks was 'well below average', 14% (n=18) stated that it was 'below average', 74% (n=98) indicated the amount was 'typical', and 10% (n=13) reported that the amount was 'above average.'

**Occupational Tasks and Physical Training Impacts:** In order to better contextualize both the officers' occupational tasks and physical training, inter-related questions between the two were asked. For example, officers were asked if they had undertaken physical training within a one-hour period prior to their most recent operational task, to which 8% (n=11) of participants responded 'yes' and the remaining 92% (n=122) responded 'no'. They were further queried as to what type of physical training they had undertaken prior to their last task, with the most frequent and second most frequent responses being aerobic conditioning (31%: n=41) and resistance training (23%: n=30), respectively. Of significance, 100% of the 132 respondents reported that they did not consider that the physical training session undertaken prior to the task had any physical impact on their performance of specific tactical skills, tactics or the overall task during the subsequent operational activity.

Respondents were asked to select the type of operational task which they personally believed was the most physically demanding they had undertaken in their role as a PTG officer. Of the survey response options offered (Counter Terrorism response, Warrant execution, Water operations, Rural operations, Movement over urban terrain, Clandestine operations), the most frequent response (68%; n= 90) was rural operations, in which the nature of the task traditionally requires officers to carry heavy loads for extended periods and distances. The next most frequent response was Movement Over Urban Terrain (MOUT), a tactic used to combat active armed offenders and typified by short bursts of high intensity activity as operators move aggressively to points of cover while clearing urban landscapes.

## DISCUSSION

The aims of this study were to establish the natures and contexts of operational tasks undertaken by contemporary PTG officers and to explore the physical fitness regimes they undertake to maintain their operational fitness for these tasks. The results reflect the three main areas of investigation: a) the occupational tasks being undertaken; b) the physical conditioning undertaken by the PTG officers; c) and the inter-related aspects of occupational tasks and physical training. A key finding was that the most common occupational task undertaken by Specialist Tactical Police was the execution of high risk warrants of arrest (62%: n=82). In addition, the physical conditioning undertaken by officers was deemed operation-specific by 73% (n=96) of respondents and the specific activity types undertaken were reported to be resistance training and aerobic activity, each encompassing 90% (n=119) of respondents. The study further found that during recent operations, 'full operational load and PPE' was carried by 84% (n=111) of respondents and 74% (n=98) reported they carried additional external load, in the form of specialist equipment on top of their typical full operational load. In addition, 8% (n=11) of respondents reported they had undertaken some form of physical training within one hour of conducting the operational task, with 38% (n=50) of respondents also receiving less than one hour of notice forewarning them of the most recent operational tasking they had undertaken.

**Occupational Tasks Undertaken by PTGS:** The most commonly-undertaken operational tasks, which were executing a high-risk warrant and rural operations, require officers to carry load but

the natures of the loads and the environments in which they are carried vastly differ. Execution of a high risk warrant is typified by wearing PPE and dynamic movement, often in short repeated bursts (22) and is typically conducted in a small team construct with all operational members actively moving through an urban environment, entering buildings, dwellings, commercial properties and using specific method-of-entry tools and tactics. Once entry is made to the target premises the members move dynamically yet methodically on foot through the entire floor space of the building searching and 'clearing' all areas. Conversely, rural operations, by nature of the task in a rural landscape, are commonly of longer total duration and distance, with similar loads and role to those of an infantry soldier (19). Rural operational activities are typified by the operational members carrying heavy military packs, wearing webbing and in some instances further ballistic PPE depending on the risk and threat to the officers. The primary objective of these operations are often to apprehend suspects located in rural remote locations, or undertake reconnaissance missions to gather intelligence on illegal drug operations (for instance). Most respondents wore 'full operational loads' during operations of around 21-25kg and then carried additional external loads made up of specialist equipment, with the most commonly reported extra loads weighing 10.1-15kg. When the loads reported by respondents of this study were compared to loads reported in the literature, it was found that they were similar to those carried by specialist police in the study by Carlton et al. (5). In their study, the specialist officers carried a typical mean load of 22 kg with this load likewise excluding any additional equipment. Considering this, Pryor et al. (22) reported that specialist police could carry loads of up to 40 kg, listing additional loads consisting of large ballistic shields (13.6 kg), battering rams (15.9 kg) and a variety of forcible entry and prying tools (weighing up to 10 kg each) as potentially being carried. When considered in the terms of typical full operation loads reported carried in this study (21-25kg) with the most frequently reported additional loads carried (10.1-15kg), the findings of this study are commensurate with those of loads reported in the study by Pryor et al. (22). Furthermore, the loads reportedly carried by the officers in this study are, in some cases, similar to military loads reportedly carried by soldiers in a load configuration termed 'patrol order'. These patrol order loads weigh around 28kg (19) and constitute the load configurations in which soldiers typically engage an opponent. With these load weights known to impact on performance, including mobility (2, 5) and potentially marksmanship (4), there is a concern that the loads reportedly carried by the PTG officers in this study may impact on their occupational performance, and as such place the mission at risk. In addition, the repeated nature and exposure to these occupational load carriage requirements can increase the risk of load carriage related injuries to these personnel (12, 14) and therefore have a negative impact on unit capability (17).

**The Physical Conditioning Undertaken by PTGS:** In this study, all respondents reported that they participated in some form of physical training in the workplace, with most reporting that their conditioning programs were aimed at achieving occupational specificity in their physical training. The most commonly reported types of physical conditioning undertaken were resistance training and aerobic activity, with extreme conditioning methods, defensive tactics and group exercise also being prominent. Training frequency was typically eight or more times per two-week block, and training sessions averaged 31-60 mins at an intensity level typically reflective of a RPE of 8. These findings are of particular note when the reported physical training

workloads are considered in concert with other skills training loads imposed on personnel in this specialist policing context and the typically high operational tempo experienced by personnel in specialist law enforcement organizations (15).

When compared to the recommended physical activity requirements for the general adult population, the levels of physical conditioning reported by respondents generally meet these generic guidelines. The ACSM recommends that most adults complete moderate intensity cardiorespiratory conditioning of at least 30 mins per day for 5 days of the week, with resistance training performed 2-3 days per week (9). However, while the training programs reported by respondents in this study may meet the requirements for health and fitness in a general population, what is not known is whether the reported training regimes are sufficient to maintain the levels of fitness required to meet the demands of the specialist policing occupation. Considering this, Orr et al. (16), supported by Knapik et al. (12), highlight that, for optimal load carriage performance, load carriage specific conditioning should be conducted at least once every 7-14 days, with loads and intensities meeting those required of the officer during operations. However, with these specialist police potentially engaged in operations wearing this load on a frequent basis, this specific training need may be met by their operational activities, without additional training sessions being required. Furthermore, both Orr et al. (16) and Knapik et al. (12) note that a combination of aerobic training and strength conditioning may enhance load carriage capability. In this study, these training modalities were employed by the vast majority of respondents. On this basis, given the high-level operational requirements, which typically involve carrying load, and noting the majority of respondents undertake aerobic training and strength conditioning as part of their normal physical training regime, it would appear that the officers represented in the current study were conducting sufficient training to at least meet the load carriage conditioning requirements of their occupation.

Apart from load carriage conditioning, the general conditioning approach taken by officers would, at first glance, appear to meet the requirements of law enforcement occupations. Dawes et al. (6), for example, highlighted the need for law enforcement agencies to create job specific conditioning programs, as law enforcement tasks demand high levels of strength, muscular power, anaerobic power and muscular endurance. However, establishing what comprises operational task demands and the fitness levels required to meet them is inherently difficult (23). As such, assessing whether the conditioning practices of the PTGs reported in this study were sufficient to meet all of the complex requirements of their occupational tasks is difficult. There is a need to identify not only what the key PTG tasks comprise, as was investigated in this study, but also the physical requirements PTG officers need to meet in order to safely and effectively perform these tasks. Once these requirements have been determined, comparing the training regimes of the PTGs against best-practice for conditioning people to undertake such tasks will elucidate the appropriateness and adequacy of the conditioning currently undertaken by the PTGs.

**Inter-related Aspects of Occupational Tasks and Physical Training:** This study reported that 32% of operational taskings were of a reactive call-out nature, with 37% of respondents receiving less than one-hour of notice of the requirement to begin their most recent operational task. In

addition, 8% of the officers undertook physical training within an hour prior to the operational call out. However, interestingly, when asked if they felt this physical training session impacted their operational performance on the task, none thought that it did. The potential impact of physical training undertaken within one hour of commencing an operational tasking on operational task performance of the specialist tactical officer has not previously been considered in the available literature. Existing literature considers the effects of cumulative training load on tactical personnel and performance, and the potential risks of overuse and overreaching (15), yet no research has been conducted on the effects of physical training on immediately-following operational responses, and how occupational performance may be affected by such training.

Based on the responses of the PTG officers in this study and the potential impacts of load carriage, prior physical training and harsh operational theatres, PTG officers are clearly faced with notable challenges in occupational task performance, imposed by their operational environment. In future, operational risk mitigation strategies will need to be considered if optimal task performance is to be achieved and maintained. For example, while conditioning can improve operational task performance (7), if it has been performed immediately prior to a task, it could be a source of operational risk. The importance of optimizing physical training regimes was recognized by the PTG respondents, most of whom claimed that their conditioning programs were specifically aimed at achieving occupational specificity in their physical training.

The findings of the current study suggest the occupational requirements of the PTG are varying and inherently dangerous, with officers having to be capable of performing a variety of diverse operational tasks while carrying loads in excess of 20 kg and often substantially more. While the PTG officers appear to engage in a vast array of physical conditioning types to meet their occupational task requirements, a lack of research aligning specialist police task requirements with specific fitness capacities makes conditioning requirements difficult to ascertain. As such, research is required to examine the physiological demands of the key occupational tasks of the PTG officer reported in this study, so that best-practice approaches to conditioning can be identified, through which to optimally prepare PTG personnel for operations.

**Limitations:** A limitation of this study was potential for recall bias. As some questions in the survey covered the entire service life of the PTGs, recall bias may have been present and responses to questions about occupational tasks may not have been accurately recalled. To mitigate this risk, questions were, where possible, designed to focus on the most recent experiences of respondents.

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